

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re the Application of: **Masaharu YAMAMOTO et al.**

Art Unit: **2818**

Application Number: **10/568,075**

Examiner: **Jonathan Han**

Filed: **February 13, 2006**

Confirmation Number: **7448**

For: **HERMETIC SEALING CAP, METHOD OF MANUFACTURING
HERMETIC SEALING CAP AND ELECTRONIC COMPONENT
STORAGE PACKAGE**

Attorney Docket Number: **062092**

Customer Number: **38834**

REPLY BRIEF

Mail Stop: Appeal Brief-Patents

Commissioner for Patents

P.O. Box 1450

Alexandria, Virginia 22313-1450

February 8, 2011

In response to the Examiner's Answer mailed January 6, 2011, the following is the
Appellants' Reply Brief.

REMARKS

I. ARGUMENT

Responding to Appellants' argument in the Appeal Brief, the Examiner alleged as follows:

By utilizing the Ni-Co layer of Suzuki in layer 1 [14] of Levine as disclosed in the previous rejection in claim 1, the layer orientation is Ni-Co (layer [14] of Levine Figure 2), Ni [18], and Au [20]. This follows the orientation of the layer structure of claim 1. Furthermore, Suzuki supports this orientation by identifying the same issue of oxidizing corrosion. **By implementing this Ni-Co layer in the first layer, this controls diffusion of nickel components within the layer of gold** between the first and second layer which would cause a lower deterioration of the interior layers and preventing the body from becoming positively charged (see Suzuki, ¶[0033-0034] and Levine, Column 4, lines 41-64). This creates the hermetic sealing cap structure of claim 1. Furthermore, as stated in Levine, the multi-layered structure protects the inner layers from further deterioration and reduces EMF difference that causes diffusion of the inner layers therefore the second layer of Ni inherently inhibits the first layers from diffusing out into the solder layers (see Levine, Column 4, line 65- Column 5, line 8) as the same materials (Ni-Co and Co) are used as well as the same orientation of layers are implemented between the prior art and the instant case.

However, there is no reason for a person of ordinary skill in the art to apply the Ni-Co layer of Suzuki in layer 14 of Levine. The layer structure of Suzuki is completely different from that of Levine, and it is not clear why a person of ordinary skill in the art would utilize the Ni-Co layer of Suzuki in layer 14 of Levine.

Suzuki describes as follows:

[0033]

In this case, if the gold layer 11 is less than 0.1 μm , it tends to become difficult to effectively prevent the oxidation corrosion of the nickel layer 9

or the nickel cobalt layer 10. If the thickness exceeds 3 μm , when the metal lid body 2 is joined to the metallized layer 6 for closure by seam welding, the current which flows into the thick gold layer 11 increases while the current which flows into the metal lid body 2 decreases, and there is a possibility that melting of the solder material 8 may be barred and the intensity of junction may deteriorate. Therefore, it is preferred to make the thickness of said gold layer 11 in the range of 0.1 μm - 3 μm , and the range 0.1 μm - 2 μm is further preferred.

[0034]

According to the wiring board of this invention, because **the nickel cobalt layer 10 is formed directly under the gold layer 11, a cobalt component inhibits diffusion of nickel components, it rarely happens that some nickel of the nickel layer 9 or the nickel cobalt layer 10 diffuses through the gold layer 11**, being exposed on the surface of the gold layer 11 and oxidized to generates a nickel oxide and nickel hydroxide with poor wettability to the solder material 8; thus firm junction to the metallized layer 6 and the solder material 8 is constantly obtained.

(Suzuki, paragraph [0033]-[0034], revised from machine translated version). Thus, according to Suzuki, the Ni-Co layer 10 is formed directly under the Au layer 11 because a Co inhibits diffusion of Ni. In order to prevent diffusion of nickel into gold layer, Ni-Co layer has to come between the nickel layer and gold layer, making the order of the layers **Ni/ Ni-Co/Au**.

In contrast, according to claim 1, when the diffusion accelerator is Co, the order of the layers is **substrate/Ni-Co/Ni/Sn solder layer**. Thus, the order of the layers is different between Suzuki and the present invention. Moreover, the solder layer of Suzuki is not “mainly composed of Sn.”

Another reference, Levine describes at the portion cited above as follows:

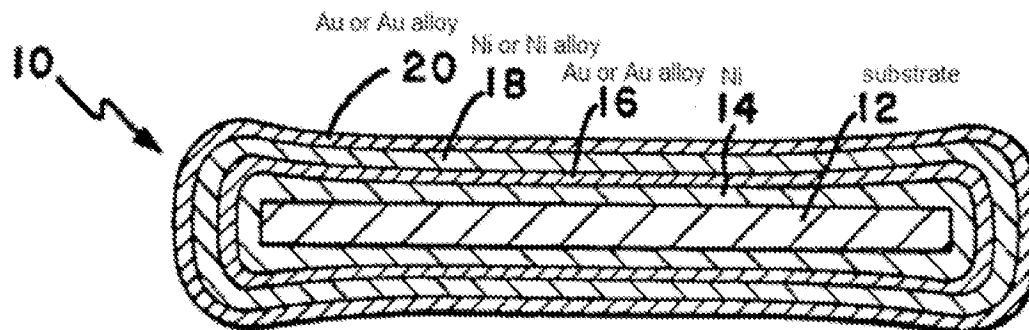
In contrast in the present invention, with the second nickel layer 18 and the second gold layer 20, there is no EMF difference between the two gold layers and there is no transport of iron ions, for example, to the surface of the second gold layer. This is because the nickel metal has a lower electromotive force than the gold. As soon as the channel is filled with metal oxides up to gold layer 16, the electrolyte becomes depleted and no

further corrosion action takes place. The channels are so small in diameter that with the stopping-off of galvanic action at gold layer 16, no observable corrosion is observed.

(Levine, Column 4, line 65- Column 5, line 8). Here, Levine discusses the stopping-off of galvanic action at gold layer 16. Levine also describes as follows:

A first layer 14 of nickel or a nickel based alloy is plated on the base material 12 by any conventional electroplating process, including barrel plating, strip plating, rack plating or a combination of such techniques. The so-called "dog-bone" thickness profile of barrel plating of **nickel layer 14** is shown in FIG. 1. The thickness of the nickel layer, measured at the center of layer 14, is preferably in the range of about 10 to 300 microinches, more preferably in the range of about 50 to 200 microinches. All references to the thickness of layers herein refer to the thickness at the center of the layer. Most preferably, the thickness of nickel of layer 14 is about 100 microinches. A **first layer 16 of gold or a gold based alloy** is plated on nickel layer 14 also by any conventional plating technique, although the profile of barrel plated part is shown in the drawing. The thickness of gold layer 16, is preferably in the range of about 5 to 150 microinches, more preferably about 10 to 75 microinches. Most preferably, the thickness of gold at the center of layer 16 is about 25 microinches. A **second layer 18 of nickel or a nickel based alloy** is plated onto gold layer 16 by an electroplating process, and preferably has a thickness in the ranges indicated for layer 14. Preferably, nickel layer 18 has approximately the same thickness as first nickel layer 14. A **second layer 20 of gold or a gold based alloy** is plated onto nickel layer 18 by an electroplating process, and preferably has a thickness in the range indicated for layer 16. Preferably, gold layer 20 has approximately the same thickness as first gold layer 16. The resulting product greatly minimizes corrosion when the part is subjected to a salt spray atmosphere.

(Levine column 4, lines 9-40).



Thus, Levine discusses Ni/Au/Ni/Au structure. Levine also describes as follows:

It has been surprisingly discovered that when a **second set of nickel and gold layers** is plated onto a base metal, with the total gold thickness being approximately the same as with a conventional nickel-gold plated part, **the corrosion resistance of the part is greatly improved.**

(Levine column 3, lines 27-31). Thus, according to this explanation Levine, there are at least two sets of nickel and gold layers. Such a layer structure is irrelevant to the layer structures of Suzuki and the present invention. Levine further describes as follows:

Also, the tendency for oxidation and corrosion to occur is more pronounced in plated layers which are relatively thin, and hence may be porous. In general, corrosion may occur with plated layers in which the plating thickness is less than about 500 microinches.

Preferably, the metals of the first and third layers are selected from the group of nickel, titanium, chromium, tin and their alloys. **Most preferably, the metal of the first and third layers, which act as diffusion barriers, is nickel.**

Also preferably, the metals of the second and fourth layers are selected from the group of gold, copper, silver, palladium, platinum or their alloys. Most preferably, the metal of the second and fourth layers, which act as corrosion resistant layers, is gold.

Preferably, the metals of the first and third layers are the same, and are plated to approximately the same thickness, and the metals of the second and fourth layers are the same, and are plated to approximately the same thickness.

(Levine column 6, lines 41-60). According to Levine, nickel layers are the barrier layers, and nothing indicates need of additional layer or Ni-Co layer between the nickel layer and the gold layer. Moreover, like Suzuki, Levine fails to layer structure which includes “a solder layer mainly composed of Sn.”

The Examiner alleged that “Kim discloses a solder layer mainly composed of Sn formed on a region of the surface of said second layer to which said electronic component storing member is bonded” referring to paragraph [0031]-[0032]. Kim et al. describes, at the cited portion, as follows:

[0031] The lid frame 2 may be formed of a transparent material, such as glass, quartz, or a material, such as Si, ceramic, and Kovar, and the junction layer 5 may be formed of Cr or Ti. Preferably, the wetting layer 6 is formed of Ni and Cu, and **the solder layer 7 is formed of at least one selected from In, Sn, Bi, Ag, and Zn**, and the first protection layer 8 is formed of Au. Also, the thickness of the first protection layer 8 is, preferably, but not necessarily, less than 1000Å.

[0032] The junction layer 5, the wetting layer 6, and the solder layer 7 are laminated through heat or e-beam evaporation, sputtering, electroplating, non-electrolysis deposition, and screen printing and are manufactured in a high vacuum apparatus so as to prevent the oxidation of each layer.

(Kim et al., paragraph [0031]-[0032]). Thus, Kim et al. simply describes Sn as an example of the materials to form a solder layer of a particular lid frame. As explained above, Suzuki addresses a particular metalized layer of Ni/Ni-Co/Au. Also, Levine discusses the particular layer structure Ni/Au/Ni/Au, or Ni/(Cu, Ag, Pd, Pt)/Ni/Au. Even a solder layer formed of Sn was known, it has nothing to do with the layer structures of Suzuki and Levine.

Therefore, even if Levine is combined with Suzuki and Kim et al., there is no reason for a person of ordinary skill in the art to make a sealing cap comprising “a substrate; a first layer, formed on the surface of said substrate, mainly composed of Ni containing a diffusion accelerator; a second layer formed to be in contact with the surface of said first layer; and a solder layer mainly composed of Sn formed on a region of the surface of said second layer to which said electronic component storing member is bonded, wherein said second layer is formed so as to inhibit said first layer from diffusing into said solder layer at a first temperature and diffuse said first layer into said solder layer through said second layer when said solder layer bonds to said electronic component storing member at a second temperature higher than said first temperature,” as recited in claim 1.

Further responding to Appellants’ argument in the Appeal Brief, the Examiner alleged as follows:

Appellant also argues that Examiner's allegations of the term "accelerator" ignores ordinary meaning and consistent use of the word. However, based on the definition of acceleration in physics and statistical mechanics, acceleration is the rate of change of velocity over time and does not necessitate the need for the system to increase in velocity as argued by the Appellant. Furthermore, Appellant's disclosure also keeps the acceleration of the system vague as to whether it is an increase or decrease in speed, but merely notes whether diffusion occurred or not. With no indication of increase in speed by the appellant in the disclosure (no rates or changes are provided), Examiner provided the same material utilized by the appellant for a diffusion accelerator (Cobalt; see rejection above, claim 1 and page 28 Paragraph 3 of the Appellant's specification). Therefore, it would be expected that based on the disclosure of the Appellant as well as the prior art of the record that Cobalt (Co) would function identically in both the combination of Levine, Suzuki, and Kim as the instant application.

However, the present invention would be related to chemical or material engineering rather than physics and statistical mechanics. Webster's Encyclopedic Unabridged Dictionary defines the term "accelerator" and the term "accelerate" as follows:

ac·cel·er·a·tor *n.* 1. a person or thing that accelerates, 2. *Auto.* a device, usually operated by the foot, for controlling the speed of an engine. 3. *Brit.* any two- or three-wheeled motor vehicle, as a motorcycle or motor scooter. 4. *Photog.* a chemical, usually an alkali, added to a developer to increase the rate of development. 5. Also called **accelerant**. *Chem.* any substance that increases the speed of a chemical change, as one that increases the rate of vulcanization of rubber or that hastens the of concrete, mortar, plaster, or the like. 6 *Anat., Physiol.* any muscle, nerve, or activating substance that quickens a movement. 7. Also called **atom smasher, particle accelerator**. *Physics.* an electrostatic or electromagnetic device, as a cyclotron, that produces high-energy particles and focuses them on a target. 8. *Econ.* See acceleration coefficient.

ac·cel·er·ate *v.t.* 1. to cause faster or greater activity, development, progress advancement, etc., in: *to accelerate economic growth*. 2. to hasten the occurrence of: *to accelerate the fall of a government*. 3. *Mech.* to change the velocity of (a body) or the rate of (motion); cause to undergo acceleration. 4. to reduce the time required for (a course of study) by intensifying the work, eliminating detail, etc. *-v.i.* 5. to move or go faster, increase in speed. 6. to progress or develop faster.

As seen in these definitions, the definition alleged by the Examiner appears to be limited to the fields of mechanics or dynamics. In the ordinary meaning, "decelerate" is used when the speed decreases. Webster's Encyclopedic Unabridged Dictionary defines the term "decelerate" as follows:

de·cel·er·ate *--v.t.* 1. decrease the velocity of: *He decelerates the bobsled when he nears a curb*. 2. to slow the rate of increase of: *efforts to decelerate inflation*. *-v.i.* 3. to slow down: *The plane decelerated just before landing*.

Thus, the Examiner's allegations on the term "accelerator" ignore the ordinary meaning of the term in the relevant field and the consistent use of the word in the present specification.

The Examiner also alleged as follows:

Furthermore, based on the translation used by the Examiner (attached for convenience), states:

[0034] According to the wiring board of this invention, the nickel cobalt layer 10 is formed directly under the gold layer 11. Since a cobalt component **controls** diffusion of nickel components, some nickel of the nickel layer 9 or the nickel cobalt layer 10 diffuses the inside of the gold layer 11, and it exposes to the surface of the gold layer 11 . . . " (emphasis added).

By this translation, the cobalt component controls diffusion and does not inhibit or slow down the diffusion, thereby controls the rate of diffusion (i.e., an accelerator) and allows for nickel to diffuse into the outer gold layer. Therefore, since materially and functionally, the diffusion accelerators are identical in both the instant application as well as the prior art, Examiner's cobalt in the nickel-cobalt layer is considered an accelerator" by definition.

The translation apparently is a machine translation on which, the Japanese Patent Office specifically notes, that "the translation may not reflect the original precisely." The attorney for the appellant is proficient both in English and Japanese and the translation cited by the Appellant is his corrected version of the machine-translation version. The original text is complex and difficult for a computer to correctly translate.

As to the word "control" translates the Japanese word "抑制する(yokusei-suru)", the Progressive Japanese-English Dictionary, published by Shogakukan, give translations of "restrain; control; check, repress" and give the examples of "control [check] inflation," "control [restrain] one's passions," "in order to control the movements of terrorists," and "I cannot hold back [repress] my discontent any longer." Although Japanese-English Dictionary gives the

translation “control,” the uses of “control” translating “抑制する(yokusei-suru)” is limited to the meaning of restrain, check, or repress. Therefore, the word “control” should have been more accurately translated as “inhibit” “restrain” or “repress.” In the machine translation, the clause “Since a cobalt component **controls (inhibits)** diffusion of nickel components” contradicts its following clause “some nickel of the nickel layer 9 or the nickel cobalt layer 10 diffuses the inside of the gold layer 11, and it exposes to the surface of the gold layer 11.” Thus, the latter clause is clearly erroneous. The Appellants’ attorney’s version, repeated below, is more accurate than the machine translation.

[0034]

According to the wiring board of this invention, because **the nickel cobalt layer 10 is formed directly under the gold layer 11, a cobalt component inhibits diffusion of nickel components, it rarely happens that some nickel of the nickel layer 9 or the nickel cobalt layer 10 diffuses through the gold layer 11,** being exposed on the surface of the gold layer 11 and oxidized to generates a nickel oxide and nickel hydroxide with poor wettability to the solder material 8; thus firm junction to the metallized layer 6 and the solder material 8 is constantly obtained.

Thus, none of the Examiner’s responses to Appellants’ arguments justify the Examiner’s rejection of the claims of the present application.

Therefore, claims 1-20 patentably distinguish over the combination of Levine, Suzuki, Kim et al., Woolhouse et al. and Shiomi et al. as discussed in the appeal brief.

II. CONCLUSION

As discussed in the appeal brief and this reply brief, the present invention as recited in claims 1-20 patentably distinguish over the combination of Levine, Suzuki, Kim et al., Woolhouse et al. and Shiomi et al.

For the foregoing reasons, the Examiner has failed to establish a prima facie case of obviousness in the rejection of the present claims. The Honorable Board is respectfully requested to reverse the rejection of the Examiner.

If this paper is not timely filed, appellants hereby petition for an appropriate extension of time. The fee for any such extension may be charged to Deposit Account No. 50-2866, along with any other additional fees that may be required with respect to this paper.

Respectfully submitted,

WESTERMAN, HATTORI, DANIELS & ADRIAN, LLP

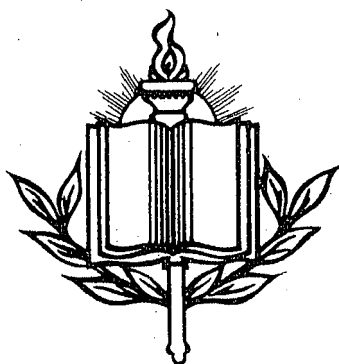
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Attachments: Webster's Encyclopedic Unabridged Dictionary
Progressive Japanese-English Dictionary

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The dictionary entries are based on the Second Edition of
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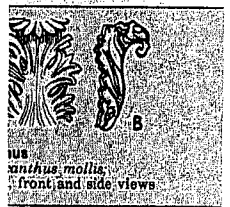
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phal(a), neut. pl. of *acan-*
-CEPHALOUS + -AN]
sit/), *n. Pathol.* an abnor-
mal projection, found in the
lipoproteinemia and certain
180-85; ACANTHO- + -CYTE
n'thō sī tō'sis), *n.* a condi-
tion of acanthocytes in
-osis]
hō'dē-en), *n.* any small,
of the extinct order Acan-
ra. [1860-55; < NL *Acan-*
(equiv. to *Acanthodes*) a
richly spiny; see ACANTH-

d), *adj.* spiny; spinous.
pl'ē jō), *n. Biol.* the study
or certain spiny-headed
relate to taxonomic classifi-
cation — *acanthothol-ic* (ak
an'thō-lō-gist, *n.*
k'an thōp'ē rī'ē en), *adj.*
the Acanthopterygii (Acan-
finned fishes, including the
an acanthopterygian fish.
ygi(t) (acantho- ACANTHO-
fin + L -i masc. pl. ending)

adj. spinous. [ACANTH- +



pl. -thus-es, -thi (-thi). 1.
nus Acanthus, of the Med-
iny or toothed leaves and
vers. Cf. *Acanthus* family.
as in the Corinthian capi-
tus plant. [1610-20; < NL
t] — *a-can-thine* (ə kan'-

plant family Acanthaceae,
a plants and shrubs hav-
ing tubular bracted
is dispersed by exploding
a, caricature, and shrimp

pl.-), *n. Med.* a deficiency
of and tissues. [1905-10;
kleses (a- A- + *kaphnōs*
from the fact that smoke
cap'nī-əl, *adj.*

ā' kăp pel'jā), *Musical*. 1.
iniment. 2. in the style of
-80; < It: in the manner of

bē ō', It. ā' kă prēt'chō),
with whatever expression
according to caprice]

Sp. ā'kă pōōl'kō), *n.* a
ico, on the Pacific. 466,700.
a strong and highly prized
Mexico. [1965-70]

athol. congenital absence
— *a-cardi-ac* (ā kār'dē-

carus.
pl. -ses (-sēz'). *Pathol.*
p. mites. 2. a skin disease
scabies. [1820-30; < NL;

car(e)-), *n.* a substance or
[1875-80; ACAR(us) + -i-

acarine, esp. a mite of the
or pertaining to an acarid.

rin), *n.* 1. any of numer-
ous, comprising the mites
or pertaining to the order
Ar(e)ni. [1820-30; < NL
qu. to *Acarus* (name of a
neut. pl. of -inus -inē)
ā, nān'yo), *n.* a coastal
fancient Greece; now part
of Acarnania in modern
Greece. — *Ar-car-na-ni-an*,

resembling a mite or tick.

ellow resin obtained from
as, esp. *Xanthorrhoea* has-
as and lacquers and as a
d accretions gum.

n. the branch of zoology
[ACAR(us) + -o- + -logy]

tō'bē ō), *n. Psychiatry*. a
n is infested with mites or
utilization in order to elimi-
nate ACARUS, -o-, -PHOBIA]

a-car-pel-ous (ā kār'pē les), *adj. Bot.* having no car-
pels. Also, *a-car-pel-ous*. [1875-80; A- + CARPEL +
-ous]

a-car-pous (ā kār'pēs), *adj. Bot.* not producing fruit;
sterile; barren. [< Gk *akarpōs*. See A- + -CARPOUS]

ac-a-rus (ak'ar es), *n. pl. -ari* (-ə rī'), a mite, esp. of
the genus *Acarus*. [1650-60; < NL < Gk *akari* mite]

a-cat-a-lect-ic (ā kat'el'ektik), *Prosa*. — *adj.* 1. not
catalectic; complete. — *n.* 2. a verse having the com-
plete number of syllables in the last foot. Cf. *catalectic*,
hypercatalectic. [1880-90; < LL *acatalecticus*. See A- +
CATALECTIC]

a-cat-a-lep-sy (ā kat'el'ep'sē), *n. Philos.* an ancient
Skeptical view that no more than probable knowledge is
available to human beings. [1595-1605; < ML *acata-*
lepsia < Gk *akatalēpsia*, equiv. to *akatalēpt(ein)* to not
comprehend (v. deriv. of *akatalēptos* incomprehensible,
ungraspable; see A- + CATALEPSY) + -ia -ia] — *a-cat-a-*
lep-tic (ā kat'el'ep'tik), *n., adj.*

a-cau-dal (ā kād'v), *adj. Zool.* tailless. Also, *a-cau-*
date (ā kād'dat). [1855-60; A- + CAUDAL]

ac-au-les-cent (ak'ō les'ent, ā'kō-), *adj. Bot.* not
caulescent; stemless; without visible stem. Also, *a-cau-*
line (ā kō'lin, -lin), *a-cau-lose* (ā kō'los), *a-cau-lose*
(ā kō'los). [1860-55; A- + CAULESCENT] — *ac-au-les-*
cence, *n.*

a-caus-al (ā kō'zal), *adj.* having no cause. [A- +
CAUSAL] — *a-cau-sal-ity*, *n.*

acc-, 1. accelerate. 2. acceleration. 3. accept. 4. ac-
ceptance. 5. accompanied. 6. accompaniment. 7. ac-
cordant. 8. according. 9. account. 10. accountant. 11.
accusative.

Ac-cad (ak'ad, ā'kād), *n. Akkad*.

Ac-ca-dian (ə kād'dē en, ə kād'-), *n., adj.* Akkadian.

ACCD, American Coalition of Citizens with Disabilities.

ac-cede (ak sēd'), *v.* — *ced-ed*, *ced-ing*. 1. to give
consent, approval, or adherence; agree; assent; to *accede*
to a request; to *accede* to the terms of a contract. 2. to
attain or assume an office, title, or dignity; succeed (usu-
ally fol. by to): to *accede* to the throne. 3. *Internat. Law*.
to become a party to an agreement, treaty, or the like,
by way of accession. [1400-50; late ME: to approach,
adapt to < L *accedere* to approach, assent, equiv. to *ac-*
ce + *cedere* to go; see CEDE] — *ac-ced-ence*, *n.* — *ac-*
ced'er, *n.*

— *Syn.* 1. See agree.

ac-cel-, accelerating.

ac-cel-er-an-do (ak sel'ə ran'dō, -rān'-), *It.* at che'le-
rān'dō), *adv., adj. Music.* gradually increasing in speed.
[1835-45; < It < L *accelerandus*, gerundive of *accelerāre*
to speed up. See ACCELERATE]

ac-cel-er-ant (ak sel'ər ant), *n.* 1. something that
speeds up a process. 2. *Chem.* accelerator (def. 5). 3. a
substance that accelerates the spread of fire or makes a
fire more intense: Arson was suspected when police
found accelerants at the scene of the fire. [1915-20; < L
accelerant- (s. of *accelerans*) hastening (prp. of *ac-*
celerare). See ACCELERATE]

ac-cel-er-ate (ak sel'ə rāt'), *v.* — *at-ed*, *at-ing*. — *v.t.*
1. to cause faster or greater activity, development, pro-
gress, advancement, etc., in: to *accelerate* economic
growth. 2. to hasten the occurrence of: to *accelerate* the
fall of a government. 3. *Mech.* to change the velocity of
(a body) or the rate of (motion); cause to undergo accel-
eration. 4. to reduce the time required for (a course of
study) by intensifying the work, eliminating detail, etc.
— *v.i.* 5. to move or go faster; increase in speed. 6. to
progress or develop faster. [1515-25; < L *accelerātus*
speeded up (ptp. of *accelerare*), equiv. to *ac-* + *celer-*
swift + -ātus -AT-] — *ac-cel-er-a-ble*, *adj.* — *ac-cel-*
er-at-ed-ly, *adv.*

ac-cel-er-ated read'er, *Educ.* a teaching device into
which a page of reading material is inserted and ad-
vanced one line at a time, gradually increasing the speed
to accelerate and improve one's rate of reading com-
prehension.

ac-cel-er-a-tion (ak sel'ər rā'shən), *n.* 1. the act of
accelerating; increase of speed or velocity. 2. a change
in velocity. 3. *Mech.* the time rate of change of velocity
with respect to magnitude or direction; the derivative of
velocity with respect to time. [1525-35; < L *accelerā-*
tiō (s. of *acceleratio*). See ACCELERATE, -ION]

accelera-tion clause, a provision of a mortgage,
loan, or the like that advances the date of payment
under certain circumstances. [1930-35]

accelera-tion coeffi-cient, *Econ.* the ratio of
change in capital investment to the change in consumer
spending. Also called *accelerator*, *coefficient of ac-*
celeration. Cf. *acceleration principle*.

ac-cel-er-a-tion-ist (ak sel'ə rā'shā nist), *n. Econ.* a
person, esp. an economist, who advocates or promotes
the acceleration principle. [ACCELERATION + -IST]

accelera-tion of grav-ity, *Physics*. the accelera-
tion of a falling body in the earth's gravitational field,
inversely proportional to the square of the distance from
the body to the center of the earth, and varying some-
what with latitude; approximately 32 ft. (9.8 m) per sec-
ond per second. Symbol: *g* Also called *gravity*. [1885-
90]

accelera-tion prin-ciple, *Econ.* the principle that
an increase in the demand for a finished product will
create a greater demand for capital goods. Also called
accelerator prin-ciple. [1940-45]

ac-cel-er-a-tive (ak sel'ə rā'tiv, -ər ē'tiv), *adj.* tend-
ing to accelerate; increasing the velocity of. Also, *ac-cel-*
er-a-to-ry (ak sel'ər ē tōr'ē, -tōr'ē). [1745-55; ACCELE-
RATE + -IVE]

ac-cel-er-a-tor (ak sel'ə rā'tar), *n.* 1. a person or
thing that accelerates. 2. *Auto.* a device, usually oper-
ated by the foot, for controlling the speed of an engine.
3. *Brit.* any two- or three-wheeled motor vehicle, as a
motorcycle or motor scooter. 4. *Photog.* a chemical,

usually, an alkali, added to a developer to increase the
rate of development. 5. Also called *accelerator*. *Chem.*
any substance that increases the speed of a chemical
change, as one that increases the rate of vulcanization of
rubber or that hastens the setting of concrete, mortar,
plaster, or the like. 6. *Anat., Physiol.* any muscle, nerve,
or activating substance that quickens a movement. 7.
Also called *atom smasher*, *particle accelerator*. *Phys-*
ics. an electrostatic or electromagnetic device, as a cyclo-
tron, that produces high-energy particles and focuses
them on a target. 8. *Econ.* See *acceleration coeffi-*
cient. [1605-15; 1930-35 for def. 7; ACCELERATE + -OR]

ac-cel-er-o-gram (ak sel'ər ə gram'), *n.* a graphic
record in chart form, produced by an accelerometer in
response to seismic ground motions. [1970-75; ACCELE-
RATION + -O- + -GRAM]

ac-cel-er-o-graph (ak sel'ər ə graf', -gräf'), *n.* an
accelerometer containing a pendulum device for measur-
ing and recording ground motions produced by earth-
quakes. [1905-10; ACCELERATION + -O- + -GRAPH]

ac-cel-er-om-e-ter (ak sel'ər om'ē tər), *n.* an instru-
ment for measuring acceleration, as of aircraft or guided
missiles. [1900-05; ACCELERATION + -O- + -METER]

accent (n. ak'sent; v. ak'sent, ak sent'), *n.* 1. promi-
nence of a syllable in terms of differential loudness, or of
pitch, or length, or of a combination of these. 2. degree
of prominence of a syllable within a word and sometimes
of a word within a phrase: *primary accent*; *secondary ac-*
cent. 3. a mark indicating stress (as ' /, /, or (/, /, /),
or (/, /), vowel quality (as French grave ' acute ' circum-
flex ' /), form (as French la "the" versus là "there"), or
pitch. 4. any similar mark. 5. *Pros.* a regularly recur-
ring stress. 6. a mark indicating stress or some other
distinction in pronunciation or value. 6. a musical tone
or pattern of pitch inherent in a particular language ei-
ther as a feature essential to the identification of a vowel
or a syllable or to the general acoustic character of the
language. Cf. *tone* (def. 7). 7. Often, *accents*. a. the
unique speech patterns, inflections, choice of words, etc.,
that identify a particular individual: We recognized his
accents immediately. She corrected me in her usual mild
accents. b. the distinctive style or tone characteristic of
an author, composer, etc.: the unmistakably Brahmsian
accents of the sonata; She recognized the familiar *accents*
of Robert Frost in the poem. 8. a mode of pronuncia-
tion, as pitch or tone, emphasis pattern, or intonation,
characteristic of or peculiar to the speech of a particular
person, group, or locality: French *accent*; Southern *ac-*
cent. Cf. *tone* (def. 5). 9. such a mode of pronunciation
recognized as being of foreign origin: He still speaks with
an *accent*. 10. *Musical*. a. a stress or emphasis given to
certain notes. b. a mark noting this. c. stress or empha-
sis regularly recurring as a feature of rhythm. 11.
Math. a. a symbol used to distinguish similar quantities
that differ in value, as in *b'*, *b''*, *b'''* (called *b prime*, *b*
second or *b double prime*, *b third* or *b triple prime*, re-
spectively). b. a symbol used to indicate a particular unit
of measure, as feet (') or inches ("), minutes (') or seconds
("). c. a symbol used to indicate the order of a derivative
of a function in calculus, as *f'* (called *f prime*) is the first
derivative of a function *f*. 12. words or tones expressive
of some emotion. 13. *accents*, words; language; speech:
He spoke in *accents* bold. 14. distinctive character or
tone: an *accent* of whining complaint. 15. special atten-
tion; stress, or emphasis: an *accent* on accuracy. 16. a
detail that is emphasized by contrasting with its sur-
roundings: a room decorated in navy blue with two red
vases *accents*. 17. a distinctive but subordinate pat-
tern, motif, color, flavor, or the like: The salad dressing
had an *accent* of garlic. — *v.t.* 18. to pronounce with
prominence (a syllable within a word or a word within a
phrase): to *accent* the first syllable of "into"; to *accent* the
first word of "White House." 19. to mark with a writ-
ten accent or accents. 20. to give emphasis or promi-
nence to; accentuate. [1520-30; < L *accentus* speaking
tone, equiv. to *ac-* + *centus*, comb. form of *cantus*
song (see CANTO); trans. of Gk *prosōidia* PROSODY]
— *ac-cent-less*, *adj.* — *ac-cent-u-a-ble* (ak sen'chōō ə-
bəl), *adj.*

ac-cent mark, a mark used to indicate an accent,
stress, etc., as for pronunciation or in musical notation.
Cf. *diacritic* (def. 1). [1885-90]

ac-cent-ric (ak sen'tar, ak'sen-), *n.* any oscine bird of
the family Prunellidae, of Europe and Asia, resembling
sparrows but having more finely pointed bills, as the
hedge sparrow. [1815-25; < NL: a genus of such birds,
LL: one who sings with another, equiv. to L *ac-* +
centor, comb. form of *cantor* singer; see CANTOR]

ac-cent-tual (ak sen'chōō əl), *adj.* 1. of or pertaining
to accent or stress. 2. *Pros.* of or pertaining to poetry
based on the number of stresses, as distinguished from
poetry depending on the number of syllables or quanti-
ties. [1800-10; < L *accentus* (s. of *accentus*) + -AL']
— *ac-cent-tual-ly*, *n.* — *ac-cent-tual-ly*, *adv.*

ac-cent-u-ate (ak sen'chōō ā't), *v.t.* — *at-ed*, *at-ing*.
1. to give emphasis or prominence to. 2. to mark or
pronounce with an accent. [1725-35; < ML *accentuātus*
intoned (ptp. of *accentuare*). See ACCENT, -ATE]

ac-cent-u-a-tion (ak sen'chōō ā'shən), *n.* 1. an act
or instance of accentuating. 2. something that is ac-
centuated. [1820-30; < ML *accentuatiō* (s. of *accentuatio*)
intoning. See ACCENTUATE, -ION]

ac-cent-u-a-tor (ak sen'chōō ā'tar), *n.* 1. *Electron-*
ics. a circuit or network inserted to provide less loss or
greater gain to certain frequencies in an audio spectrum,
as a preemphasis spectrum. 2. a person or thing that
accentuates. [1875-80; ACCENTUATE + -OR]

ac-cept (ak sept'), *v.t.* 1. to take or receive (some-
thing offered); receive with approval or favor: to *accept* a
present; to *accept* a proposal. 2. to agree or consent to;
to *accept* to: to *accept* a treaty; to *accept* an apology. 3. to
respond or answer affirmatively to: to *accept* an invita-
tion. 4. to undertake the responsibility; duties, honors,
etc., of: to *accept* the office of president. 5. to receive or
admit formally, as to a college or club. 6. to accommo-
date or reconcile oneself to: to *accept* the situation. 7. to

regard as true or sound; b
cept Catholicism. 8. to
usual. 9. to receive: as
Com. to acknowledge, by
ment, and thus to agree to
liberative body) to receiv
of the duty with which
been charged; receive fo
the committee was accep
(something attached; inse
cept a three-pronged pl
planted organ or tissue) v
ject (def. 7). — *v.i.* 14
position, etc. (sometimes
cepten < MF *acceptor* <
-cep-, take, comb. form o
— *Syn.* 2. concede. 7.
ject.

— *Usage*. ACCEPT and
as verbs because of their
rapid speech. ACCEPT mu
cept this trophy), while i
tain types of damage ar
insurance policy).

accept-a-ble (ak sep't-
thy of being accepted. 2.
factory; agreeable; welco
requirements; barely a
mance. 4. capable of be
acceptable levels of radi
ceptabilis. See ACCEPT.
— *cept-a-ble-ness*, *n.* —

ac-cept-ance (ak sep't-
receiving something off
proval; favor. 3. the a
ceptance of a theory. 4.
cepted or acceptable. 5.
an engagement to pay a
when it becomes due, d
drawn. b. an order, dra
accepted as calling for
to pay. [1565-75; ACCEP-

accept-ance race,
accept-ance re/gior
a test statistic for which
Cf. *rejection region*.

ac-cept-an-cy (ak sep'
of accepting; acceptance
receive; receptiveness.

ac-cept-ant (ak sep't-
ceiving or receiving; r
-ANT)

ac-cept-a-tion (ak'se-
accepted meaning of a
regard; approval. 3. b
[1400-50; late ME < M

ac-cept-ed (ak sep'ti-
ally regarded as norma
ciation of a word; on a
+ -ed] — *ac-cept'ed*

accepted / *ed* m/sons

(def. 2b).

accepted pair/ing
which two or more can
such a manner that ce
but one product is ma
cial or desirable than i

ac-cept-ee (ak'sep't-
as for military service.

ac-cept-er (ak'sep't-
cepts. [1575-85; ACCEP-

ac-cept-ing (ak'sep't-
was always more accep
her teammates. [1570-
-ing-ly, *adv.* — *ac-cep-*

ac-cept-ive (ak'sep't-
accept; receptive: She i
tions. 2. reasonably s
tive mode of transport
on the model of RECEP

ac-cep-tor (ak'sep't-
person who accepts a
drawee who signs the
ness to pay it when d
om, *ac-cep-tor* impu-
in a semiconducting c
ture an electron, creat
and thereby changing
crystal. 4. *Chem.* an s
pound that combines
thereby profoundly i
properties: electron ac
ME, in phrase accepto
(< AF *acceptour*) < L
to accept to receive, ge

ac-cess (ak'ses), *n.*
to approach, enter, ap-
have access to the file
approachable. The ho
way or means of appr
was a rough dirt ro
through Jesus Christ.
ease. 6. a sudden and
cession. 8. See publi
make contact with or
approach, enter, etc.;
checking accounts; ins
system. 10. Comput
one part of a compute
tween an external s
— *adj.* 11. Televisi
able to the public: Six
[1275-1325; ME *ac-*
approach, equiv. to ac
+ -tus suffix of v. ac

Shogakukan

PROGRESSIVE

Japanese-English Dictionary

小学館

プログレッシブ

和英中辞典

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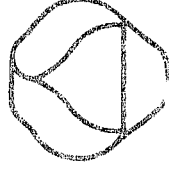
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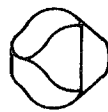
天満美智子

吉本元志子

Peter Martin



To the Memory of
Professor Doi Kōchi



「メビウスの帯(Möbius band)」
長方形の帯を1度ねじって両端を
結びつけて作ったもの。あらゆる
方向に自由な広がり、永遠に循環
する。国際語としての英語の広か
りと、言葉の結びつきを重視した
本辞典のシンボルマークです。

まえがき

本辞典の起源は四半世紀以上も前にさかのぼる。当時津田塾大学英文学部主任
兼付属語学研究所長であった土居光知教授の、和英辞典に対する新しい構想のも
とにこの仕事は始まった。当時の和英辞典は日英語ともに難解な言葉を並べるこ
とが多く、もう一度英英辞典や英和辞典で語義や用例を確かめねばならなかった。
土居先生は日英の基本語の比較分析をもとに、紙面を増すことなく和英、英英の
二冊分の機能を合わせもつ辞典を構想されたのである。この方針はその後もずっ
と一貫して、私たちを支えてきた。

和英辞典はなによりも良い英語を書くことを目標としなければならない。文法
的に正しい英語 (correct English) を書くことも必要であるが、それ以上に良い
英語 (good English) を書くことが大切である。そのためには、まず日英語の言
語習慣の違いを充分に知る必要がある。例えば日本語では「ぶらぶら歩く」「気取
って歩く」「とぼとぼ歩く」など、「歩く」という一つの動詞に副詞または副詞句
をつけて歩き方を示す。しかし英語では “walk” に副詞をつけるのではなく、
“stroll” “strut” “trudge” など、動詞そのものによって歩き方を示すのである。
このような表現に英語本来の特質、その活力が存するのであり、これを認識して
こそ good English に到達できるのである。本書はこれを読者に伝え、真に英語
らしい英語とは何かを示すことに努めた。

作業の第一歩は日本語の語義立てから始まった。適当な英訳を見つけないとす
る際、先ず日本語の意味を明らかにしなければならぬ。本辞典では、重要な語
については原義を1、比喩の意味をIIに分けるなど、語義分けを厳密にし、日本
語の概念を明確にするように努めた。日本語を言語体系の異なる英語と比較分析
することにより、結果的には、従来の国語辞典には見られなかったような日本語
の特質が多く浮かび上がってきたと自負している。

収録した日本語の語彙は、日常生活の表現に必要な基本語、新聞・雑誌に登場
する各分野の専門用語、身近な動植物の名、新語など7万余にのぼる。これは一
般の国語辞典に相当する語彙であり、しかも最も up-to-date でかつ広範囲な現
代日本語の集積となっている。

見出し語や用例の英訳に関しては、現在使われている自然な英語になるように
心掛けた。また訳語の意味の差異、使い分けを簡潔に説明し、使用上の正確さを
期した。しかし本書を特徴づけるのは、なんといいっても、10万にのぼる豊富な用
例にある。生きた言語は文脈によって用法が異なる。本書では日本語のいろいろ
な活用を考え、代表的な文型を例証することによって、すぐにも応用できるよう

